

REMARKS

United States Serial No. 10/526,953 was filed on November 30, 2005. The application is subject to a rejection of claims 1-4 and 21-27. In view of the remarks set forth herein, Applicants respectfully request that the rejection of claims 1-4 and 21-27 be withdrawn and that a formal Notice of Allowance be issued with respect to claims 1-4 and 21-27.

35 U.S.C. § 103

Claim 1-4 and 22-25 have been rejected under 35 U.S.C. § 103(a) as obvious over U.S. Patent No. 6,287,052 to Bassett, et al. ("Bassett"), in view of International Application No. WO 99/18330 to Ellenberger ("Ellenberger").

Preliminarily, Applicants respectfully submit that the present Office Action does not adequately respond to Applicants' previous assertion that, because of the vast differences between shield tunnel boring machines (as disclosed in Ellenberger) and hard rock tunnel boring machines (as disclosed in the present application), Ellenberger cannot be seen as analogous art to any disclosure of hard rock tunnel boring machines. Applicants' arguments to this effect from Response A (paragraph bridging pages 6-7), which were reiterated in Response B, are as follows:

Ellenberger discloses the boring of relatively soft material by means of a shield boring tunnel machine. In such shield boring tunneling machines, boring liquids or foams are used because they facilitate the removal of the material being bored. The construction of shield tunneling boring machines, which are only used for boring of tunnels in non-rock strata, is substantially different from the construction of hard rock tunnel boring machines. Such hard rock tunnel boring machines contain cutting elements constructed from hardened steel discs which protrude from the cutting head. In contrast, shield boring tunneling [machines do] not need such hardened steel discs because the material through which [they bore] is much softer.

The only paragraph of the present Office Action which appears to address these remarks is paragraph 7, on page 8, where it is alleged that Bassett discloses that there are different kinds of boring machines. It is unclear as to how this assertion renders Ellenberger analogous art;

Ellenberger discusses only soft strata tunnel boring machines, and the disclosure of Bassett does nothing to suggest combination with or substitution of Ellenberger's apparatus for hard rock tunnel boring machines.

In fact, Basset, at col. 1, line 27 through col. 2, line 10 shows that the arts of soft strata boring and hard strata boring are quite different, mentioning different problems associated with each discipline. Further, Basset discloses that foaming compositions used in soft strata boring have not worked in hard strata boring, as discussed in more detail below.

Thus, the Office still makes no showing of facts which would rebut Applicants' assertion that Ellenberger is non-analogous art. Applicants respectfully submit that, because Ellenberger is non-analogous art with respect to any disclosure of hard rock tunnel boring machines, one of skill in the art would not look to Ellenberger to modify any apparatus or method which is directed to hard rock tunnel boring machines, including the disclosure of Bassett, regardless of the fact that Bassett is alleged to disclose (without admitting that it does) both hard rock and soft strata tunnel boring machines. The disclosure of Bassett will be discussed in more detail below.

With regard to claim 1, the Office has alleged that Bassett discloses a method for boring rock using a tunnel boring machine by injecting into the formation to be bored just before the cutting tools of the boring machine an aqueous foam composition to reduce wear, wherein the boring machine comprises rotary head with cutting wheels, which allegedly meets the recitation of claim 1 which describes a tunnel boring machine comprising hardened steel discs which protrude from the cutting head. While the Office has admitted that Bassett does not disclose using a polyethylene oxide lubricant, the Office has alleged that Ellenberger discloses such a lubricant, and that the presently claimed method would have been obvious to a person of skill in the art based on the combination. Thus, Ellenberger is utilized merely for its disclosure of the specific class of lubricants recited in present claim 1.

Applicants respectfully submit that Bassett does not disclose a tunnel boring machine comprising hardened steel discs which protrude from the cutting head. MPEP § 2142 states that

[t]he key to supporting any rejection under 35 U.S.C. 103 is the clear articulation of the reason(s) why the claimed invention would have been obvious. The Supreme Court in *KSR International Co. v. Teleflex Inc.*, . . . 82 USPQ2d 1385, 1396 (2007) noted that the analysis supporting a rejection under 35 U.S.C. 103 should be made explicit. The Federal Circuit has stated that “rejections on obviousness cannot be sustained with mere conclusory statements; instead, there must be some articulated reasoning with some rational underpinning to support the legal conclusion of obviousness.” *In re Kahn*, . . . USPQ2d 1329, 1336 (Fed. Cir. 2006). See also *KSR*, . . . 82 USPQ2d at 1396 (quoting [*Kahn*] with approval).

The Office, in the paragraph bridging pages 2 and 3 of the Office Action, states that “Bassett discloses the boring machine comprises a rotary head with cutting wheels (i.e. discs) (C2 L52-C3 L20 See also Figures 1-3) meeting the limitation for hardened steel discs protruding from the cutting head.” The Office does not clearly articulate how a disclosure of a rotary head with cutting wheels teaches or suggests the recitation of present claim 1 which requires “a tunnel boring machine comprising hardened steel discs which protrude from the cutting head”; the statement made by the Office is merely a conclusory statement. The disclosure of a rotary head with cutting wheels, without mentioning the material from which the cutting wheels are made, cannot be seen as a teaching or suggestion of “hardened steel discs which protrude from the cutting head”. Therefore, Applicants respectfully submit that the Office has not met its burden of establishing a prima facie case of obviousness.

Assuming, without admitting, that Bassett discloses what the Office alleges, Applicants respectfully submit that the alleged combination of Bassett and Ellenberger is improper. First, as discussed above, Ellenberger is non-analogous art with regard to hard rock tunnel boring. Ellenberger and Bassett are therefore non-analogous when used in a combination which is directed to hard rock tunnel boring, and cannot be combined for that purpose. The disclosures in Bassett do nothing to overcome the non-analogous nature of Ellenberger with respect to hard rock tunnel boring.

Second, Bassett teaches away from any combination of the lubricant of Ellenberger. Bassett, at column 1, line 65 through column 2, line 10, states that:

Foams have been used comprised only of water and surface-active agent(s) (and a gas such as air) in the case of confinement boring machines. The purpose of the water foam [in] this case [is] to fluidize the excavated material, to improve the permeability of the soil (which is possible precisely by virtue of the nature of the terrain encountered by this type of boring machine) and thus to reduce the torque applied to the machine.

This technique has been tried in rock tunneling machines and is ineffective, i.e., it does not provide substantial progress.

The use of lubricating systems has likewise been tried, also without significant results.

Thus, in discussing soft strata boring machines (referred to as confinement boring machines in Bassett – see column 1, lines 30-32), Bassett teaches that foam and/or lubricating compositions had previously been utilized in order to fluidize the excavated material and to soften it before excavation. Bassett teaches that these methods have not worked for the same purposes, or to reduce wear, in the use of hard rock tunnel boring machines. Therefore, one of skill in the art, after reading Bassett, would not try to use a lubricating composition utilized in soft rock tunnel boring for hard rock tunnel boring applications, because Bassett teaches that the soft rock tunnel boring lubricants are ineffective for use in hard rock tunnel boring applications. Applicants respectfully submit that Bassett teaches against any combination with a soft rock tunnel boring lubricant, such as that found in Ellenberger, and that the Office has therefore failed, for an additional reason, to meet its burden of establishing a prima facie case of obviousness.

It should be noted that, even if the combination of Bassett and Ellenberger is proper (without admitting that it is), the combination would still not teach or suggest the method of present claim 1, because, as discussed above, Bassett does not disclose a tunnel boring machine comprising hardened steel discs which protrude from the cutting head. Ellenberger discloses nothing to overcome this deficiency of Bassett.

For the reasons above, Applicants respectfully submit that claim 1 is not taught or suggested by the references, either alone or in combination, and request that the 35 U.S.C. § 103(a) rejection of claim 1 be withdrawn.

Applicants submit that, since claim 1 is not taught or suggested by the combination of Bassett and Ellenberger, for the above reasons, claims 2-4 and 22-25, which ultimately depend from claim 1, are also not taught or suggested. *See In re Fine*, 837 F.2d 1071, 5 USPQ2d 1596 (Fed. Cir. 1988). (“If an independent claim is nonobvious under 35 U.S.C. 103, then any claim depending therefrom is nonobvious.” MPEP § 2143.03 at page 2100-142.) Applicants therefore respectfully request that the 35 U.S.C. § 103(a) rejection of claims 2-4 and 22-25 be withdrawn.

Claims 21 and 26-27 have been rejected under 35 U.S.C. § 103(a) as obvious over Bassett, in view of Ellenberger, further in view of U.S. Patent No. 4,796,702 to Scherubel (“Scherubel”).

The deficiencies with regard to the combination of Bassett and Ellenberger are discussed above. Scherubel, being used only for its alleged teaching of nonionic surfactants, discloses nothing to overcome these deficiencies. Scherubel discloses a surfactant mixture comprising a zwitterionic surfactant, a nonionic surfactant and a cationic surfactant, which forms a foamable liquid composition upon addition to aqueous media including fresh water, brines, acids, and water/alcohol mixtures (Abstract). The mixture of Scherubel has utility as a hydrocarbon deposit fracturing fluid and/or a well cleaning fluid (Abstract), which means that the mixture is used to prepare and clean a well bore after the bore is already drilled (see col. 2, lines 47-51 and col. 5, lines 24-28). Thus, the mixture is not used during boring operations. For these reasons, in addition to the fact that the Office is using Scherubel merely for its disclosure of nonionic surfactants, Scherubel cannot be seen as analogous art. A person of skill in the art would not look to Scherubel to modify a liquid composition used in hard strata boring methods.

Further, Scherubel does not discuss soft strata boring or hard strata boring, and thus does not suggest that these art areas can be seen as analogous, let alone that hard strata boring may be performed with a cutting head comprising hardened steel discs. Neither does Scherubel provide

motivation to one of skill in the art to utilize its surfactant mixture in a hard strata boring method. Therefore, the combination of Bassett, Ellenberger and Scherubel (or any of the references individually) does not teach or suggest the method of present claim 1.

Applicants submit that, since claim 1 is not taught or suggested by the combination of Bassett, Ellenberger and Scherubel, for the above reasons, claims 21 and 26-27, which ultimately depend from claim 1, are also not taught or suggested. *See In re Fine*, 837 F.2d 1071, 5 USPQ2d 1596 (Fed. Cir. 1988). ("If an independent claim is nonobvious under 35 U.S.C. 103, then any claim depending therefrom is nonobvious." MPEP § 2143.03 at page 2100-142.) Applicants therefore respectfully request that the 35 U.S.C. § 103(a) rejection of claims 21 and 26-27 be withdrawn.

In view of the above remarks, Applicants respectfully request reconsideration of the application and withdrawal of the 35 U.S.C. § 103(a) rejections of claims 1-4 and 21-27, and request the issuance of a formal Notice of Allowance with respect to claims 1-4 and 21-27.

Applicants have addressed the instant rejections with respect to the independent claim in particular, and have distinguished the applied references as discussed above. It is therefore deemed unnecessary to address specific allegations of the Office Action regarding the dependent claims. Applicants therefore traverse these allegations, and do not concur with the same either explicitly or implicitly by not refuting each individually.

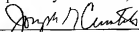
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Should the Examiner have any questions about the above remarks, the undersigned attorney would welcome a telephone call.

Respectfully submitted,



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